LISTING OF CLAIMS

1. (Previously presented) A method of electrochemically filling cavities on a wafer surface to form a substantially planar conductive layer, comprising the steps of:

applying a first cathodic current to form a first conductive layer on the wafer surface, the wafer having a first cavity and a second cavity, wherein the first cavity has the smallest width and the second cavity has a larger width than the first cavity, and wherein the first and the second cavities are less than 10 micrometers in width;

treating a surface of the first conductive layer by applying a first anodic current waveform;

applying a second cathodic current to form a second conductive layer on the first conductive layer; and

treating a surface of the second conductive layer by applying a second anodic current waveform,

wherein the second anodic current waveform has a longer duration than the first anodic current waveform.

2. (Canceled)

3. (Canceled)

4. (Previously presented) The method of claim 1, wherein the step of treating the surface of the first conductive layer prevents bump formation on the surface of the first conductive layer.

5. (Original) The method of claim 1, wherein the steps of applying first and second cathodic currents comprise applying DC voltage.

6. (Original) The method of claim 1, wherein the steps of applying first and second cathodic currents comprise applying AC voltage.

7. (Previously presented) The method of claim 1, further comprising repeating the steps of treating and applying until all the cavities on the wafer surface are filled.

8. (Canceled)

9. (Previously presented) A method to electrochemically fill a plurality of cavities on a wafer surface comprising:

applying a first cathodic current to fill a first cavity and partially fill a second cavity with a first conductive layer on the wafer surface, the first cavity having a smaller

width than the second cavity wherein the first cavity and the second cavity each include a width less than 10 micrometers;

applying a first anodic current waveform to treat the first conductive layer, the first anodic current waveform comprising at least one anodic current pulse;

applying a second cathodic current to fill the second cavity with a second conductive layer to form a substantially planar conductive layer over the first cavity and the second cavity; and

applying a second anodic current waveform to treat the second conductive layer, the second anodic current waveform comprising at least one anodic current pulse,

wherein the second anodic current waveform has a longer duration than the first anodic current waveform.

10. (Previously presented) The method of claim 9, wherein applying the first cathodic current includes applying a cathodic DC waveform.

11. (Previously presented) The method of claim 9, wherein applying the first cathodic current includes applying a cathodic AC waveform.

12. (Previously presented) The method of claim 9, wherein the first anodic current waveform includes a plurality of anodic current pulses.

13. (Previously presented) The method of claim 12, wherein the anodic current pulses are each approximately 1 second in duration.

14. (Canceled)

15. (Previously presented) A method of electrochemically filling cavities on a wafer surface to form a planar conductive layer, comprising:

providing a first cavity with a smallest width and a second cavity having a larger width than the first cavity, wherein the first and second cavities are less than 10 micrometers in width;

applying a first cathodic current waveform to form a first conductive layer on the wafer surface;

treating the first conductive layer by applying a first anodic current waveform;

applying a second cathodic current waveform to form a second conductive layer on the first conductive layer, the second conductive layer having a planar portion over the first cavity; and

treating the second conductive layer by applying a second anodic current waveform,

wherein the second cathodic current waveform has a longer duration than the first cathodic current waveform and the second anodic current waveform has a longer duration than the first anodic current waveform.

16. (Previously presented) The method of claim 15, wherein applying the first cathodic current includes applying a cathodic rectangular waveform.

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Original) The method of claim 15, wherein the planar conductive layer is copper.

21. (Previously presented) The method of claim 1, wherein the step of applying the first cathodic current comprises forming the first conductive layer including a planar portion over the first cavity and a non-planar portion over the second cavity.

22. (Previously presented) The method of claim 1, wherein the step of applying the second cathodic current comprises forming the second conductive layer including a planar portion over both the first and second cavities.

23. (Previously presented) The method of claim 1, wherein the step of treating the surface of the second conductive layer prevents bump formation on the surface of the second conductive layer.

24. (Previously presented) The method of claim 1, wherein the second anodic current waveform includes a greater number of anodic current pulses than the first anodic current waveform.

25. (Previously presented) The method of claim 1, wherein the second cathodic current is applied for a longer time than the first cathodic current.

26. (Previously presented) The method of claim 9, wherein applying the second cathodic current includes applying a cathodic DC waveform.

27. (Previously presented) The method of claim 9, wherein applying the second cathodic current includes applying a cathodic AC waveform.

28. (Previously presented) The method of claim 9, wherein the second anodic current waveform includes a greater number of anodic current pulses than the first anodic current waveform.

29. (Previously presented) The method of claim 9, wherein the second cathodic current is applied for a longer time than the first cathodic current.

30. (Previously presented) The method of claim 9, wherein the second anodic current waveform includes a plurality of anodic current pulses.

31. (Previously presented) The method of claim 30, wherein the anodic current pulses are each approximately 1 second in duration.

32. (Previously presented) The method of claim 15, wherein the second cathodic current waveform is a cathodic rectangular waveform.

33. (Previously presented) The method of claim 15, wherein the first anodic current waveform includes a plurality of anodic current pulses of approximately 1 second in duration.

34. (Previously presented) The method of claim 15, wherein the second anodic current waveform includes a plurality of anodic current pulses of approximately 1 second in duration.

35. (Previously presented) The method of claim 15, wherein the second anodic current waveform includes a greater number of anodic current pulses than the first anodic current waveform.

36. (Previously presented) The method of claim 15, wherein applying the first cathodic current waveform comprises forming the first conductive layer including a planar portion over the first cavity and a non-planar portion over the second cavity.

37. (Previously presented) The method of claim 36, wherein the first cavity is filled and the second cavity is unfilled.